Title: Impact of a 1755-like tsunami in Huelva, Spain

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Abstract: Coastal areas are highly exposed to natural hazards associated with the sea. In all cases where there is historical evidence for devastating tsunamis, as is the case of the southern coasts of the Iberian Peninsula, there is a need for quantitative hazard tsunami assessment to support spatial planning. Also, local authorities must be able to act towards the population protection in a preemptive way, to inform 'what to do' and 'where to go' and in an alarm, to make people aware of the incoming danger. With this in mind, we investigated the inundation extent, run-up and water depths, of a 1755-like event on the region of Huelva, located on the Spanish southwestern coast, one of the regions that was affected in the past by several high energy events, as proved by historical documents and sedimentological data. Modelling was made with a slightly modified version of the COMCOT (Cornell Multi-grid Coupled Tsunami Model) code. Sensitivity tests were performed for a single source in order to understand the relevance and influence of the source parameters in the inundation extent and the fundamental impact parameters. We show that a 1755-like event will have a dramatic impact in a large area close to Huelva inundating an area between 82 and 92 km(2) and reaching maximum run-up around 5 m. In this sense our results show that small variations on the characteristics of the tsunami source are not too significant for the impact assessment. We show that the maximum flow depth and the maximum run-up increase with the average slip on the source, while the strike of the fault is not a critical factor as Huelva is significantly far away from the potential sources identified up to now. We also show that the maximum flow depth within the inundated area is very dependent on the tidal level, while maximum run-up is less affected, as a consequence of the complex morphology of the area.

KeyWords Plus: 1755 Lisbon Tsunami; Numerical Simulations; Earthquake; Record

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